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THE UNIVERSITY OF TENNESSEE INDEX
SERIES III—NO. 7—SEPTEMBER, 1902

COURSES IN AGRICULTURE
AT THE
UNIVERSITY OF TENNESSEE

Education for Southern Farmers

GENERAL VIEW OF BUILDINGS, UNIVERSITY FARM

Courses of Practical Instruction in Agriculture, Animal
Husbandry, Horticulture, Dairying, Mechanic Arts
and Poultry, January 2 to March 14, 1903

COURSES OFFERED

One Year and Two Years Short Courses, Four Years Course,
Special Courses in Animal Husbandry, Dairying,
Horticulture and Poultry

Published by the University of Tennessee, and entered at the Post Office at Knoxville as
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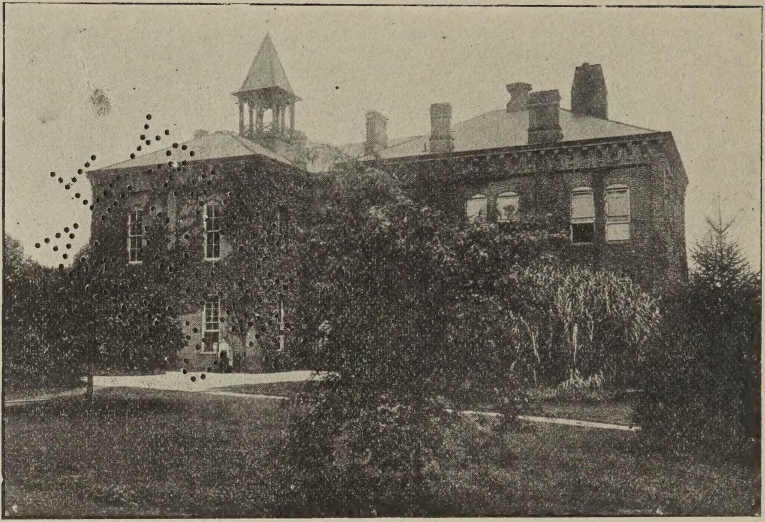


Morrill Hall, the Agricultural Building

OFFICERS OF INSTRUCTION

Charles W. Dabney, Ph. D., President and Professor of Economics

Andrew M. Soule, B. S. A., Professor of Agriculture and Chairman Department of Agriculture

Charles A. Keffer, Professor of Horticulture and Forestry

Samuel M. Bain, A. B., Professor of Botany

William W. Carson, M. Am. Soc. C. E., Professor of Civil Engineering

——————, Professor of Mechanic Arts

Charles E. Ferris, B. S., Assistant Professor of Drawing

Charles A. Mooers, B. S., Instructor in Agricultural Chemistry

John R. Fain, B. S., Instructor in Animal Husbandry

Samuel E. Barnes, M. S. A., Instructor in Dairying

Phares O. Vanatter, Instructor in Agriculture.

Moses Jacob, V. M. D., Instructor in Veterinary Science

Frank B. Devant, Instructor in Shop Work

James P. Kerr, Instructor in Poultry

——————, Lecturer in Farm Law

F. H. Broome, Instructor in Farm Accounts

Thomas D. Morris, Bursar

Note.—Short course students should report promptly for enrollment and classification to Prof. Soule, whose office is in room 1, Morrill Hall.

COURSES IN AGRICULTURE

AT THE

UNIVERSITY OF TENNESSEE

EDUCATION FOR FARMERS

INTRODUCTORY STATEMENT

Ten weeks of practical instruction in agriculture, animal husbandry, poultry work, dairying, horticulture and mechanic arts are annually provided in the University of Tennessee at Knoxville for persons who desire to acquire information relating to these topics and who may never previously have had an opportunity to take a course of instruction relating solely to agricultural work and the application of the sciences on which it is based.

Time The course of 1903 will open on January 2 and continue to March 14. Owing to the fact that many young men can not secure all the information they desire in one term of 10 weeks, the course has been extended to two terms of 10 weeks each, so that those who attain a certain standard of scholarship the first year may return another year and in a measure complete their studies.

Expenses The expenses of the short course, exclusive of railroad fare, are between $40 and $50, a sum so small that any industrious young man can earn enough during the remainder of the year to meet it. The principal item of expense is board, as tuition is free, and the only charge the University makes is the nominal sum of $7 as an incidental and breakage fee. Board costs in Knoxville from $2.50 to $3.50 per week, so that this item alone amounts to $30 or $35. A syllabus of lectures is provided in place of text books for $2 and the white duck suits used in the dairy laboratory cost about $3. Thus, the farmer or his boy can attend the course for an outlay of $4 or $5 per week, or from 60 to 75 cents per day, and acquire information of the greatest value and utility for but little more than his living expenses at home.

Entrance Requirements Any young man or woman 16 years of age who has a fair country school education will be admitted to these courses. Many inquiries are received from men who wish to take them, but who think they are too old. As some of our best students have been 30 to 40 years of age, they may have every reason to feel encouraged as they will be benefited by the work. There are no entrance examinations, the ability of a student to profit by the instruction given being determined in other ways. Many persons whose educational facilities have been restricted seem to fear that they will be unable to appreciate the work of the short course. This view is exceedingly unfortunate as the work is made so eminently practical and the lectures given are so very simple that they can readily be understood by any one.

Course of Study, 1903 The subjects taught in the short course have been arranged so as to show those comprising the first and second years' work. These subjects will be as follows. Whenever possible the lectures are illustrated by means of the stereopticon and the student receives a syllabus of each lecture for future reference and study:

FIRST YEAR

AGRICULTURE—20 hours
- Farm Crops
- Soil Culture

ANIMAL HUSBANDRY—40 hours
- Animal Design
- Breeds
- Breeding
- Feeding

STOCK JUDGING—Practice 90 hours
- Beef Cattle
- Dairy Cattle
- Sheep for Wool and Mutton
- Swine
- Poultry

DAIRYING—150 hours
- Theory and Practice in Dairying
- Receiving and Separating Milk
- Care and Handling of Cream
- Butter Making and Marketing
- Pasteurizing and Bottling Milk
- Cheese Making and Curing
- Milk Testing
- Boiler and Engine

HORTICULTURE—60 hours
- Pruning and Grafting
- Orchard and Small Fruits
- Market Gardening

VETERINARY SCIENCE—60 hours
- Animal Anatomy and Physiology
- Hygiene and Horse Shoeing
- Judging Horses

AGRICULTURAL CHEMISTRY—20 hrs.
- Soils of Tennessee
- Fertilizers: Their Use and Application

MECHANIC ARTS—40 hours
- Use and Handling of Tools
- Wood Working
- Construction of Farm Conveniences

SCHEDULE OF AGRICULTURAL SHORT COURSE, 1903

FIRST YEAR

MORNING

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
8:00 9:00	Agr. Chemistry	Agr. Chemistry	Horticulture	Horticulture	Breeding	Breeds of Stock
9:15 10:15	Animal Design	Farm Crops	Farm Management	Feeding	Veterinary Science	Veterinary Science
10:15 11:45	Mechanic Arts Practice Estabrook Hall	Horticultural Practice	Mechanic Arts Practice Estabrook Hall	Horticultural Practice	Veterinary Science Practice U. Farm	Veterinary Science Practice U. Farm
11:45 1:15			NOON			
1:15 2:00	Dairying U. Farm		Dairying U. Farm		Dairying U. Farm	Excursion to Stock and Fruit Farms, etc.
2:00 6:00	2.00-6:00 Dairy Practice U. Farm	2:00-5:00 Stock Judging U. Farm	2:00-6:00 Dairy Practice U. Farm	2:00-5:00 Stock Judging U. Farm	2:00-6:00 Dairy Practice U. Farm	

NOTE—Schedule of second year furnished on application.

SECOND YEAR

- Agriculture—70 hours
  - Soil Physics
  - Forage Crops
  - Grasses and Clovers
  - Farm Management
- Agricultural Economics—10 hours
  - Resources
  - Products
  - Exports of United States and Tennessee
- Dairying—100 hours
  - Advanced Work
  - Butter Making
  - Cheese Making, etc.
  - Dairy Bacteriology
  - Assigned Reading, etc.
- Horticulture—60 hours
  - Spraying
  - Forestry
  - Nursery Work
  - Orchard Management
- Agricultural Chemistry—20 hrs.
  - Study of Soils and Fertilizers, Con.
- Botany—40 hours
  - Plant Nutrition
  - Plant Diseases
- Veterinary Science—60 hours
  - Diseases of Animals
  - Casting and Restraining Animals
- Agricultural Engineering — 20 hours
  - Road Construction
  - Farm Buildings
  - Farm Drainage
- Farm Law—10 hours
  - The Elements of Law as Related to the Farmer
- Mechanic Arts—40 hours
  - Blacksmithing
  - Electrical Appliances, etc.
  - Plumbing and Soldering
- Bookkeeping—10 hours.
  - Farm Accounts

Each course includes 450 lectures and exercises in the above subjects. Where the topics appear in the first year's work, the second course will constitute advanced work in these subjects.

Stock Judging Trip A stock judging trip forms one of the special features of the short course. The students are not required to go on this trip, but it will be to their very best interest to do so. It is desired to bring our students more closely in touch with the stock interests of Tennessee and the excursion this year will likely be to Nashville as there are many fine herds of horses, cattle, sheep and swine in the vicinity of that city.

Lectures Special lectures will be delivered once a week before the agricultural students of the University by members of the Faculty and eminent men from different sections of the State. These special lectures are held under the auspices of the Rural Science Club, an organization of agricultural students.

State Scholarships Short course students can obtain state scholarships which entitle them to free tuition. Let them apply to their senator or representative in the legislature or to the president of the University.

AGRICULTURE

Equipment Morrill Hall, the agricultural building, contains the laboratories and class rooms for agriculture, horticulture, chemistry and botany, and also the library and offices of the Experiment Station. The library contains 5,000 bound books and pamphlets and over 100 of the leading agricultural papers of the country, all accessible to students at all times.

Farm Office A two-story brick building contains the farm office, seed laboratories, etc.

STUDYING THE SOIL

The University farm comprises 105 acres. There are about 900 plats for studying rotation, selection, plant breeding, etc.

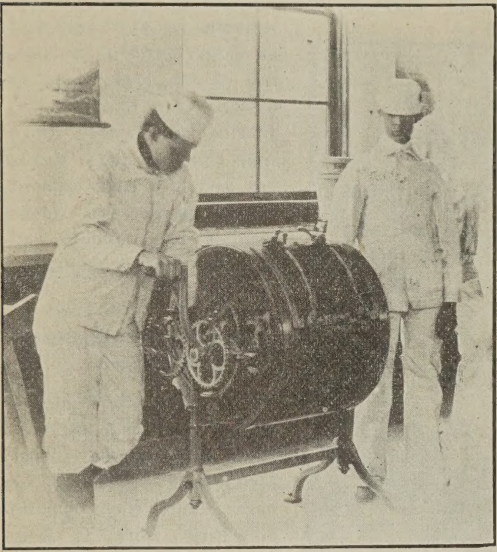
The Lectures A large number of carefully prepared lectures constitute the syllabus given on agriculture and farm crops, many of which are illustrated by means of stereopticon views based on our own experimental results.

Forage Crops The splendid series of experiments in progress at the University farm in connection with the Tennessee Experiment Station are utilized in the instruction in farm crops, forage crops, soil management, etc. Every feature of the instruction in agriculture is thus practical and the student can gather from the many useful object lessons facts which will take him years to acquire and which have a specific application to his own local conditions.

Seed Selection One of the lines of work on which special emphasis is laid is the importance of seed selection and the production of improved strains of wheat, barley, oats, cowpeas, etc. The importance of the work can hardly be over-estimated as it has been shown in tests made at the station that the yield of wheat can be increased from two to four bushels per acre by giving proper attention to the selection of the seed.

Cost of Producing Farm Crops A careful record is kept of the cost of producing all the crops grown at the University farm, whether these be for hay or ensilage, enabling the student to learn which crop produces the largest amount of digestible nutrients per acre for the maintenance of live stock at the least cost.

Grasses and Clovers Special attention is given to the subject of grasses and clovers owing to their intimate relation to the successful development of stock husbandry. Many varieties are now growing on the University farm, both singly and in combinations, to determine their relative merit for meadows, pastures and lawns. Some very valuable results with clovers have already been obtained and with so many plats to gather object lessons from the course is unusually attractive and interesting. A fine collection of museum specimens of roots, seeds and mature plants coupled with the experimental data enable the instructor to present the subject in a very graphic manner.



CHURNING

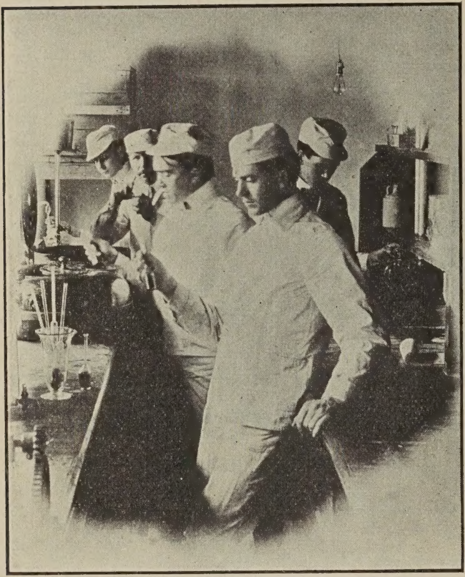
Soil Physics

Two rooms in Morrill Hall are used as laboratories for the study of the physical properties of the soil. These are fitted with the necessary tanks, vats and fixtures for carrying on the work. Beside the ordinary equipment of a laboratory, a number of sets of apparatus especially designed for this kind of work are available for the instruction of students. As several types of soil are examined the student has a chance to compare their physical properties. Four hours per week with second year men will be devoted to the work. The time will be occupied with lectures, laboratory and field work and reports on assigned reading. An outline of the course pursued follows and includes a consideration of the origin and formation of soils, types of soils and their adaptability for different crops, soil texture and influence of cultivation on the same, tillage and its effect on water content and mechanical condition, conditions affecting the movement of water and air, and the distribution of plant roots in the soil, etc.

THE DAIRY SCHOOL

Equipment The work of the dairy school is conducted in a special building on the University farm, fitted up with all modern appliances for the work at a cost of some $10,000. The dairy hall is a brick structure with a slate roof, and is especially adapted to training southern farmers in the art and practice of dairying. The building is heated by steam, lighted by electricity, and has cement floors. In this building the dairy students carry on the practical operations of a large creamery and cheese factory. In conjunction with the dairy school work the student is taken into the model dairy barn with its iron stalls, cement floors, etc., where a herd of 30 pure bred and grade Jersey and Holstein cows is kept and the feeding and management of the same are explained to him. He also takes part in the preparation of the food and assists in various ways about the work, which gives him a practical working knowledge of the dairy business.

The Lectures Before the practical work commences each day a syllabus is given out and an hour spent in discussing some topic bearing directly on dairy work. During the course more than thirty of these sheets are given to each student so that at the end of the term he has a unique and valuable text book on the subject.



Milk Testing

The Course Eminently Practical

After this the students, who are clad in white duck suits, and taught to be scrupulously clean and neat about their person and their work as well, are divided into squads; some to receive and weigh the milk, some to separate it, while others churn, make cheese or test the milk for butter fat. There are many different styles of separators, churns and other machines in the building and each student is required to work with all of them. For example, if he has a separator, he must set up the machine, run through a certain amount of milk, care for the cream, and wash and put back the machine in the condition in which he found it. If he has a churn, he must churn the cream into nice, granular butter, and salt, work and print or pack into large tubs. If he is in the cheese room, he must manufacture the raw milk into Cheddar cheese, performing every operation in a scientific and skillful manner. If he is in the testing laboratory, he must examine the samples of milk brought from the barn, drawn from the separators, churns, cheese vats, etc. Besides all this, he learns how to run a boiler and engine, how to pasteurize milk, prepare and bottle it for commercial distribution in a large city.

How could a course be made more practical? Is there not a crying demand for educated dairymen in every section of the State? Dairying is one of our most profitable industries and will develop in the most marvellous way as soon as we have a sufficient number of educated dairymen.

ANIMAL HUSBANDRY

Equipment There are two large barns on the University farm, besides sheds for calves and a new hog barn. Barn No. 1 is used as a stable for horses and beef cattle and implements. Barn No. 2 contains the dairy stable with stalls for 30 cows and a stock judging room. The hog house contains 18 pens, and as the University owns some fine blooded stock, plenty of specimens are available for instruction in all branches of stock husbandry.

Breeds The origin, history and adaptability of the different breeds of horses, cattle, sheep and swine with regard to southern conditions constitute a very important part of this course and provide reliable information of the greatest value to the stockman.

Breeding The importance and feasibility of improving the native stock through the introduction of improved sires is demonstrated by the results of various slaughter tests conducted at the Experiment Station. The result of pursuing rational lines of breeding is demonstrated whenever opportunity affords and the results occurring from the presence of certain defects in the parental types are brought out by contrast. In this way the practical application of the laws governing breeding are shown.

Feeding Feeding, or animal nutrition, considers the influence of various foodstuffs on the animal body and the lessons are further enforced by a visit to the abattoir where the slaughtering of animals possessed of certain good and bad qualities is witnessed. The utility of the various organs is also explained, as well as their relation to animal form and function.

Each winter there are feeding experiments in progress at the University farm with beef and dairy cattle, sheep and swine, and these together with the results obtained in former years furnish many useful object lessons to the amateur feeder. Side excursions are made every Saturday to neighboring farms to examine the various breeds and methods of breeding and feeding employed.

Veterinary Science Side by side with the progress of our live stock trade, we notice a rapid stride in the advancement of veterinary science. The reason for this we can readily understand, when we recall what that science includes. It does not refer alone to the study of diseased animals, but to those in health as well, as to their anatomy, physiology, zootechnics, which latter has reference to breeding, care, feeding, management, age, etc.

The Lectures The lectures will be on comparative anatomy, physiology, veterinary hygiene, horseshoeing and diseases, including those which are most common to the farm and dairy animal, as tuberculosis, parturient paresis (milk fever); anthrax, contagious abortion, hog cholera, swine plague, etc. Clinics and demonstrations will be held at the University farm where the necessary material will be at hand to give instruction on conformation, types, handling and care of horses.

STOCK JUDGING

An Ideal Necessary In order that our breeders may be most successful, they must recognize the importance of having a standard or ideal in breeding to secure uniformity, quality and correct type in their individual animals. It is the aim of the short course to provide the students with such fundamental information concerning the breeding, feeding and general management of live stock as will create correct ideals in the minds of the young men.

What the Course Includes The course of instruction in stock judging includes a consideration of the points of the different breeds of live stock, the location and value of the same, and the characteristics sought when they are perfect. The students are required by means of the score card to determine the value of animals for specific purposes; they handle them individually and place them in the order of their merit as in the show ring. They are required to examine light and heavy horses and mules, beef and dairy cattle, heifers and calves. They also work with sheep for wool and mutton and with swine for bacon and lard production. The work in stock judging is as intensely practical as it can be made. It is also one of the most valuable and instructive features of training provided in the University. To young men who are interested in breeding and feeding live stock and in the practical handling of the same, this course is invaluable.

Judging Horses

Poultry Work A special course of two weeks in poultry work will form a feature of the short course for 1903. Mr James P. Kerr, of the Biltmore Poultry Farms, has been secured as instructor in this course. Mr Kerr is in charge of one of the largest plants in the South and has made a wonderful success of the business. He is a thoroughly practical and up-to-date poultryman and is capable of giving those who desire instruction in this course a great deal of valuable and useful information.

Time of the Course The work will commence on January 19 and close January 29. A lecture will be given each morning during that time on some topic of practical importance to poultrymen.

The Lectures The lectures will cover short descriptions of the most popular and profitable breeds of chickens, ducks, geese and turkeys and how to breed and rear them; houses, coops, runs and other fittings; hatching and rearing—both artificial and natural methods; foods and feeding; capons—their value and how to make them; preparation of table fowls for market; diseases of poultry and remedies. Every afternoon two hours will be devoted to practical work of judging the different breeds of poultry.

JUDGING POULTRY

The student will be required to use the score card for that purpose and carry on the work exactly as if he were judging in a show ring. In view of the fact that the poultry industry is one of the largest and most thriving industries in Tennessee, and that it is growing so rapidly, the course will be of unusual interest and benefit to many of our farmers.

HORTICULTURE

Equipment In addition to the University orchard, the department is equipped with a good conservatory containing a fine collection of ornamental plants, a range of hotbeds and cold-frames, modern spraying apparatus for fungous diseases and for insects, a well equipped grafting room, and all necessary implements and tools for efficient horticultural work. It is believed to equal, if not surpass, any other horticultural equipment in the South.

Orchards The University orchard is entirely separate from the University farm, occupying the sides and crest of a high ridge, about a mile from the Tennessee river and adjacent to the county industrial school. The tract includes 90 acres, of which about 40 acres are devoted to the use of the horticultural department. The plantation includes about one thousand fruit trees, embracing representative varieties of apple, pear, peach, plum, cherry and quince; a hundred varieties of strawberries, and a good collection of grapes, raspberries, blackberries and other small fruits. Experiments in spraying and pruning, in vegetable growing with commercial fertilizers, and other important lines of work of practical value to the fruit grower, afford abundant opportunity for illustration and are of great interest to students.

The Course Students who have already attended one session of the short course will be given a special course in the principles of fruit growing, with especial reference to commercial orcharding, provided they are willing to devote at least one-half their time to the subject. The first course in horticulture deals with the propagation, cultivation and management of small fruits and the farm orchard, with a few lectures and exercises in vegetable growing. It includes practice in budding, root and top grafting, the making of cuttings, etc. Each student is required to make 100 apple grafts, and the exercises in other lines of work are sufficient to familiarize the student with all important fruit growing operations. Especial attention will be paid this year to pruning and spraying.

AGRICULTURAL CHEMISTRY

Useful Information Agricultural chemistry is of course a broad and a deep subject. In order to understand it thoroughly, at least a good knowledge of theoretical and general chemistry is required. Can young men, then, of limited education, such as is gotten in the country schools, get much profit from a brief course of 20 lectures on farm chemistry? They certainly can.

Aim of the Course The main purpose of the course is not to give rule-of-thumb directions, but to present the subjects so that the student can reason intelligently concerning soil fertility, and can find out for himself what may be used with profit on his own land. He becomes interested in literature on the subject, and can understand and make good use of whatever he reads. In addition to an increased store of information he is apt to go away with a more open mind and with more enthusiasm for his calling, which is more attractive to him because he has become a student of nature and is not farming merely for the dollars and cents which he may get.

BOTANY

In the Greenhouse

The Course The course in botany is designed to give the student some knowledge of the structure and functions of the various parts of flowering plants and a general idea of plant diseases. No previous knowledge of the subject is required and the instruction is entirely devoid of technical character. It is a study of roots, stems, leaves, buds, flowers and fruits, the illustrations being taken from the garden and orchard. The lectures are supplemented by a critical examination of the parts under consideration, the microscope being used whenever necessary. The course is intended to make clear to the student many of the practices of agriculture and horticulture, and hence is regarded of first importance.

DRAWING

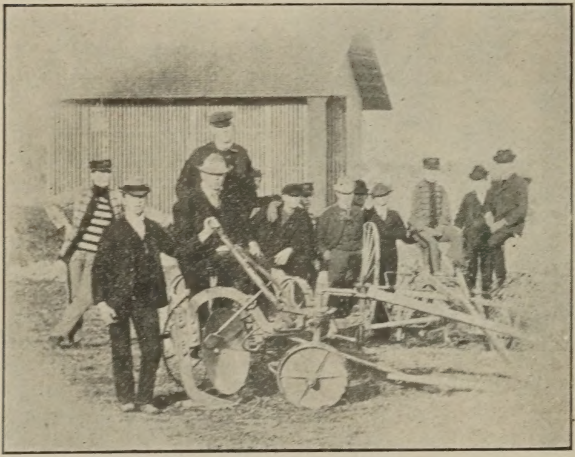
The Course Special attention will be given to study and drawing of animals, illustrating special types. The object is to teach the student the harmony and relation of the various parts of the animal body. He thus acquires a clear idea of the importance of animal proportion, symmetry and the law of correlation. The course in animal drawing is invaluable to the student of animal husbandry as it teaches him to observe the correct conformation sought for draft or speed in the race horse and for beef or milk production in cattle, etc.

MECHANIC ARTS

Equipment The shops for work in manual training are located in the large mechanical building, Estabrook Hall, which is situated on the extreme southeast corner of the University campus.

Wood=Working A special course is mapped out for the short course agricultural students with the purpose of covering as rapidly and yet as thoroughly as possible the elementary use of all ordinary carpenters' tools in chiseling, planing, sawing, mortising, dove-tailing, and similar work. This course has been very successful in giving inexperienced and consequently awkward students sufficient skill to do elementary constructive work. Students who are attentive can acquire enough practice to do all the ordinary repair jobs found on the farm. This course is given to all first year short course students.

Blacksmith Shop The course in the blacksmith shop teaches the student the proper management of his fire, the various heats of iron, the methods of working it in the different forms, and gives practice in welding. Every farm should have a blacksmith shop and the course aims to give young men enough training to enable them to make any ordinary repairs on the farm, thus saving a trip to town and consequent loss of time and money. If the student cares to go further, he will be given practice in steel working and tempering so that he can make, dress and temper his own chisels, punches and similar tools on the farm.



Examining Farm Implements

Soldering A course is offered in soldering for those who desire to take it, embracing elementary sheet-metal work, and familiarity with the principles and practice of applying solders, especially such as would be valuable in repair work. A student completing this course can with a very simple outfit repair many of the leaks in tin pans and similar utensils on the farm.

Pipe Fitting Elementary work is also offered in pipe fitting in order to teach students the various pipe fittings and their use, and give them sufficient practice in cutting pipe and cutting threads, so that much of the new pipe work and probably all of the repair work on pipes on the farm can be done by the young man who has had this course.

PRIZES FOR PROFICIENCY

A number of prizes are offered to those students showing proficiency in the various agricultural subjects.

$20 IN GOLD awarded for proficiency in judging light horses; given by Hon. E. J. Sanford, Knoxville, Tenn.

CAMP SILVER CUP. Value $20. Awarded for proficiency in feeds and feeding and breeds and breeding; given by Major E. C. Camp, Knoxville, Tenn.

ONE SILVER CUP. Value $25. Awarded for proficiency in agricultural work; given by the Deering Harvester Co., Chicago, Ill.

$20 IN GOLD awarded for proficiency in dairy work; given by The Journal and Tribune, Knoxville, Tenn.

EAST TENNESSEE FARMERS' CONVENTION SILVER CUP. Value $25. Awarded for proficiency in judging sheep and swine.

ONE TON MURIATE OF POTASH. Value $50. Awarded for proficiency in agricultural chemistry; given by the German Kali Works, New York, N. Y.

ONE SET OF THE RURAL SCIENCE SERIES. Value $12. Awarded for proficiency in agricultural work; given by the Macmillan Co., New York, N. Y.

ONE SILVER CUP. Awarded for proficiency in judging beef cattle; given by Mr. M. M. Gardner, Nashville, Tenn.

HERBERT DOMAIN-CUMBERLAND PLATEAU PRIZE, $50 IN GOLD, a scholarship for general proficiency in all subjects of the short course; given by Mr. Jos. J. Kittel, New York, N. Y.

ONE SET OF BOOKS on Agricultural and Animal Husbandry. Value $15. Awarded for proficiency in general agriculture; given by Prof. Thos. Shaw, Editor, The Farmer, St. Paul, Minn.

ONE SILVER MEDAL. Awarded for the best essay on live stock; given by the Zenner Disinfectant Co., Detroit, Mich.

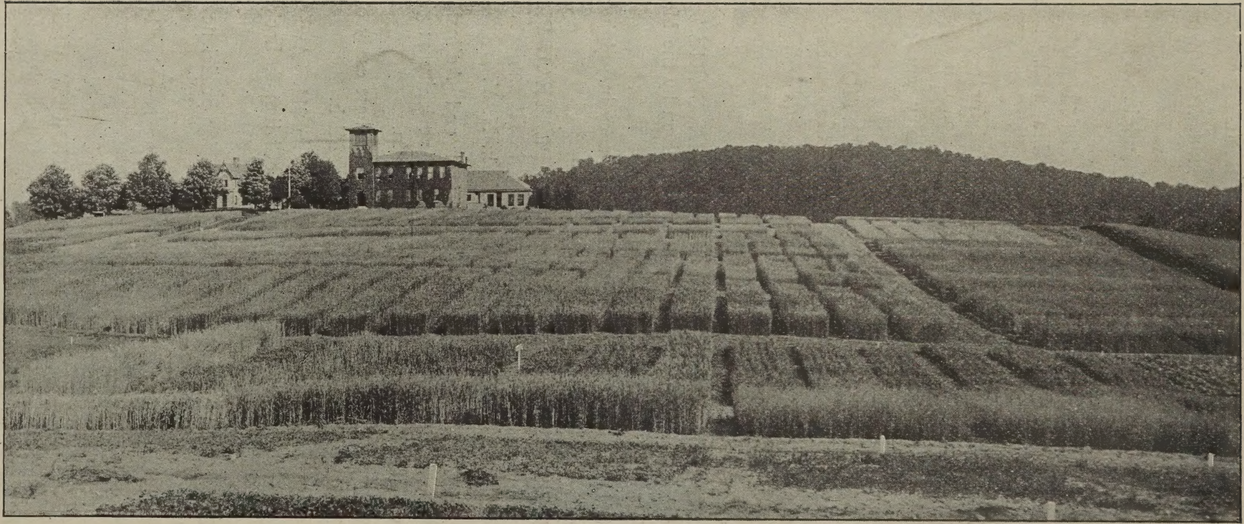
ONE VULCAN CHILLED PLOW. Value $11. Awarded for proficiency in farm crops; given by Broyles, McClellan & Lackey Company, Knoxville, Tenn.

SILVER CUP. Value $15.00. Awarded for proficiency in horticulture; given by Vaughn & Co., Chicago, Ill.

Circumstances prevented the prize list being completed when it was sent to press, but other prizes will be secured before the course opens.

For further information address,

PROF. ANDREW M. SOULE,
University of Tennessee,
Knoxville, Tenn.



General View of the Wheat Plats—University Farm

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